AMENDMENTS TO THE CLAIMS

1. (Original) A method of characterizing the biological activity of a candidate compound comprising:

placing one or more cells into an area of observation in a sample well;

exposing said one or more cells to said compound;

repetitively exposing said one or more cells to a series of biphasic electric fields at a rate of approximately 20 to 100 pulses per second, wherein said electric fields exhibit limited spatial variation in intensity in the area of observation of less than about 25% from a mean intensity in that area, and wherein said electric fields produce a controlled change in transmembrane potential of said one or more cells; and

monitoring changes in the transmembrane potential of said one or more cells by detecting fluorescence emission of a FRET based voltage sensor from an area of observation containing said one or more cells.

2. (Original) The method of Claim 1, wherein said one or more electrical fields cause an ion channel of interest to open.

3. (Original) The method of Claim 1, wherein said one or more electrical fields cause an ion channel of interest to be released from inactivation.

4. (Original) The method of Claim 1, wherein said one or more cells comprise a voltage regulated ion channel.

5. (Original) The method of Claim 4, wherein said voltage regulated ion channel is selected from the group consisting of a potassium channel, a calcium channel, a chloride channel and a sodium channel.

6. (Original) The method of Claim 1, wherein said one or more electrical fields varies over an area of observation by no more than about 15 % from the mean electrical field at any one time.

7. (Original) The method of Claim 6, wherein said one or more electrical fields varies over an area of observation by no more than about 5 % from the mean electrical field at any one time.

8. (Original) The method of Claim 1, wherein said one or more electrical fields are selected from a square wave-form, a sinusoidal wave-form or a saw tooth wave-form.

9-24. (Cancelled)